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Title: Framework for Integrated Engineered Solutions in Regional Sediment Management

Topic Area: C1: Optimal System-wide Sediment Management

Objective: This work unit will provide a framework for selecting and evaluating solutions in sediment management from a regional perspective and document lessons learned from existing demonstration projects. It will also provide for coordination of all program field investigations.

Benefits: This research will provide capabilities for optimizing project designs and operations based on regional sediment management needs that encompass multiple projects and ecosystems. Optimization of sediment management practices will substantially reduce costs, ensure environmental benefits, and help the Corps meet its stewardship objectives. This work unit will integrate the technologies and procedures developed in the other Topic Areas of the Engineered Solutions Task Area - providing a framework for sediment management strategies that encompass the entire sediment system. By documenting lessons learned from ongoing demonstration projects, it will preserve the experience gained in those projects for use across the USACE. It addresses needs as listed in the field needs appendix: 22, 24, 26, 28, 29, 31, 32, 37, 38, 39, and others.

Coordinating all RSMP field activities will produce efficiencies in data collection and promote synergistic relationships among the work units.

This work produces new tools and methods for the USACE and nation. It is an integral part of the Regional Sediment Management Research Program, and thus contributes primarily to support of the USACE's navigation, flood/storm damage reduction, and environmental protection and quality missions. It supports all 8 Civil Works strategic goals and 7 of 9 Listening Session objectives identified by HQUSACE as R&D priorities. With companion work units, it employs active technology transfer and insertion.

Work Description: The framework will incorporate existing and improved RSM capabilities, and accommodate procedures to define the regional effects of local sediment management solutions. Components from the other Topic Areas of the Engineered Solutions Task Area will be integrated in the framework providing the capability to assess individual and collective techniques for cumulative effects, and at different spatial (e.g., regional) and temporal (e.g., event-oriented) scales. The framework will reflect State regulatory and statutory needs and requirements, and integrate the missions of Federal resource agencies with a role in regional sediment management. The RSM framework and identification of state-of-the-art capabilities in engineered solutions will provide a basis and structure upon which future research and development activities can build.

Large-scale, existing sediment management projects will be compiled, compared, evaluated, and documented to provide field personnel with state-of-the-art guidance and proven

practices in regional sediment management. The projects studied will include the Upper Mississippi-Illinois Waterways studies, Chesapeake Bay Study, Demonstration Erosion Control Program, Northern Gulf of Mexico RSM Demonstration Project, Sacramento-San Juaquin Study, and the King County, WA, sediment management study. From these projects and others a draft framework for applying engineered solutions in RSM will be constructed. The framework will provide a basis and structure around which new sediment management practices (engineered solutions) can be evaluated during the RSM R&D Program and installed in the Multi-Level Analysis System created by the work unit of that name. State regulations and statutes will be reviewed to ensure that the framework satisfies the needs of the Corps, as well as the needs and requirements of State and local governments. Also, the role and position of other Federal agencies in RSM will be documented to ensure that the missions of those agencies are included in the coordination that is necessary for successful RSM activities. The framework that is developed will be applied in a demonstration project to show its usefulness in developing alternative solutions for RSM problems. At least one demonstration, application, and evaluation will be done in coordination with a Corps District on a planned or existing project, but additional demonstrations with the U.S. Forest Service and U.S. Environmental Protection Agency are anticipated.

Participants in the several demonstration projects will participate in formulating lessons learned from their experience and those lessons will be documented in Technical Notes for use in the Technology Insertion efforts.

The principal investigator will serve as the clearing house for all field investigation requests by program work units. He will endeavor to combine the field exercises and locate them in connection with existing demonstration projects or other USACE projects so that they may leverage each others' investment and create synergies in data collection and use.

Products and Schedule:

The primary products of this work will be knowledge of how local project features affect the regional sediment system, a framework for organizing and selecting local solution options, and documentation of lessons learned in demonstration projects.

Product	Scheduled
1. TN: State Regulations & Statutes that shape RSM	0502
2. TN: Characterization of Federal Agency Positions in RSM	0702
3. TN: Lessons learned from existing regional scale studies	0503
4. WORKSHOP: Framework for Assessing RSM	0703
5. TN: Framework for Assessing RSM	0903
6. JP: The State-of-the-Art in RSM	0503
7. TN: Application of Framework to Demonstration Projects	0804
8. JP: Sediment Management Practices for Systems: Where they can be used; what they achieve.	0904